



Marked-Up Version of Amendments Submitted With
Amendment; Response to the Final Office Action Mailed December 9, 2002

2039. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters positioned in heater wells to at least a portion of the formation;

allowing the heat to transfer from the one or more heaters to a part of the formation;

wherein the part of the formation has been selected for heating using a moisture content in the part of the formation, and wherein at least a portion of the part of the formation comprises a moisture content of less than about 15%; and

producing a mixture from the formation.

2040. (amended) The method of claim 2039, wherein the one or more heaters comprise at least two heaters, and wherein superposition of heat from at least the two heaters pyrolyzes at least some hydrocarbons within the part of the formation ~~from about 270 °C to about 400 °C.~~

2048. (amended) The method of claim 2039, wherein providing heat from the one or more heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from the one or more heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h \cdot V \cdot C_v \cdot \rho_B$, wherein ρ_B is an average formation bulk density, and wherein an average heating rate (h) of the selected volume is ~~less than~~ about 10 °C/day.

2050. (amended) The method of claim 2039, wherein allowing the heat to transfer to the part of the formation heats ~~providing heat from the one or more heaters comprises heating~~ the part of the formation ~~such that~~ to increase a thermal conductivity of at least a portion of the part of the formation ~~is to~~ greater than about 0.5 W/(m °C).

2072. (amended) The method of claim 2039, wherein allowing the heat to transfer ~~comprises increasing~~ increases a permeability of a majority of the part of the formation to greater than about 100 millidarcy.

2073. (amended) The method of claim 2039, wherein allowing the heat to transfer ~~further comprises substantially uniformly increasing~~ increases a permeability of a majority of the part of the formation such that the permeability of the majority of the part is substantially uniform.

2078. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters positioned in heater wells to a part of the formation;

allowing the heat to transfer from the one or more heaters to the part of the formation;

wherein at least a portion of the part of the formation has an initial moisture content of less than about 15%; and

producing a mixture from the formation.

2086. (amended) The method of claim 2078, further comprising controlling the heat such that an average heating rate of the part of the formation is less than about 1 °C per day during pyrolysis within a pyrolysis temperature range of about 270 °C to about 400 °C.

2087. (amended) The method of claim 2078, wherein providing heat from the one or more heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from the one or more heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day (P_{wr}) provided to the selected volume is equal to or less than $h \cdot V \cdot C_v \cdot \rho_B$, wherein ρ_B is an average formation bulk density, and wherein an average heating rate (h) of the selected volume is ~~less than~~ about $10^\circ\text{C}/\text{day}$.

2089. (amended) The method of claim 2078, wherein allowing the heat to transfer to the part of the formation heats ~~providing heat from the one or more heaters comprises heating the part of the formation such that to increase~~ a thermal conductivity of at least a portion of the part of the formation ~~is to~~ greater than about $0.5 \text{ W}/(\text{m } ^\circ\text{C})$.

2111. (amended) The method of claim 2078, wherein allowing the heat to transfer ~~comprises increasing~~ increases a permeability of a majority of the part of the formation to greater than about 100 millidarcy.

2112. (amended) The method of claim 2078, wherein allowing the heat to transfer ~~further comprises substantially uniformly increasing~~ increases a permeability of a majority of the part of the formation such that the permeability of the majority of the part is substantially uniform.

5398. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

evaluating a moisture content of hydrocarbon containing material in the hydrocarbon containing formation to identify a portion of the hydrocarbon containing material with ~~an a~~ moisture content that is less than about 20%;

providing heat from one or more heaters positioned in heater wells to the portion to ~~raise temperature in~~ heat the portion so that an average temperature in the portion is above a temperature sufficient to pyrolyze hydrocarbon containing material in the portion; and

producing a mixture from the formation.

5403. (amended) The method of claim 5398, wherein providing heat from the one or more heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from the one or more heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h \cdot V \cdot C_v \cdot \rho_B$, wherein ρ_B is an average formation bulk density, and wherein an average heating rate (h) of the selected volume is ~~less than~~ about 10 °C/day.